**Detailed Project Proposal**

Student Name: **Shravan Kumar Bokkala**

Student Number: **19057016**

Course: **Advanced Computer Science**

Supervised By: **Luke Wood**

Project Name: **Stock Market Prediction**

Table of Contents

[Introduction 3](#_Toc106964095)

[Research Aim 3](#_Toc106964097)

[Research Questions 4](#_Toc106964098)

[Objectives 4](#_Toc106964099)

[Short Description of Research Idea 4](#_Toc106964100)

[Plan of Research 5](#_Toc106964101)

[References 6](#_Toc106964102)

# Introduction

# Predicting the stock market is a very challenging task as well as difficult. The efficient hypothesis of the stock market stipulates that the current equity or share market value depends entirely on all available information (Ferreira et al., 2021). This also reveals that past and present data is immediate and can be incorporated into the stock value, so price changes are simply due to current information and also dependent on current information. Since equity and share value is happening randomly and unpredictably right now, the stock price should follow a random walk pattern and the best bet for the next value is the current value. If this assumption is true, then all attempts to predict the stock market are based on the assumption. Although many reports demonstrate that stock values are not completely random, all agree that the stock price graph is almost a random walk (Nabipour, et al., 2020). Beat rate accuracy is often reported as a positive outcome of equity forecasts.

Besides the active stock market hypothesis as well as, the random movement hypothesis, there are two ways of thinking related to technical analysis and fundamental predictive stock market analysis. The core analysis evaluates the financial health, performance, and/or macroeconomic indicators of a company to determine the intrinsic value of that company's total shares. The main target will be based on buying or selling if the domestic value is higher or lower than the equity or share market value (Mokhtari, et al., 2021); however, proponents of the successful hypothesis of the stock market argue that a stock's intrinsic price remains equal to its present value. One of the big problems with these technologies is "self-destruction". Once profitable and successful trading techniques will reveal, the opportunity of becoming rich will immediately disappear if all stockholders and traders want to buy the same share.

# Research Aim

Machine learning models are widely used today to predict their performance. These methods combine several predictions from one or more paths to improve the accuracy of a single prediction and avoid potential overfitting problems. In addition, ANN is a standardized measurement tool and a flexible computational framework that can be used for many time estimation problems with a high degree of accuracy. Therefore, reviewing the literature review, this study will test the predictive power of a set of modern machine learning methods, including modeling and deep reading methods. Applying GRU-RNN and LSTM techniques to retraining problems and comparing their performance with the Yahoo stock market was the final research project included in this study. I will choose companies from the either power or banking sectors to predict.

# Research Questions

1. Why the stock market is volatile?
2. What are the issues and challenges of stock market prediction?
3. How accurate are LSTM and GRU-RNN to predict the stock market?
4. How accurate the model can predict in the case of the power sector or banking sectors?

# Objectives

1. To analyze the stock market volatility factors and risk factors of investing in the stock market.
2. To analyze the issues and challenges of stock market prediction.
3. To use LSTM and GRU-RNN for the stock market prediction and compare the performance.
4. To use the best model to predict future stock prices for the power sector or banking sector.

# Short Description of Research Idea

Stock market forecasting is intended to determine the future development of the stock market value of a stock exchange. Direct prediction of stock price movements will generate more profits than potential investors. Predicting the market is difficult because of the unpredictable nature of the future. Short-term sellers are often better off waiting to be assured that a conversion is imminent, rather than trying to predict that conversion will happen in the future.

Investing in the stock market is one of the best ways to build wealth. One of the advantages of the stock market is that there are many ways to make a profit. But with great rewards, it can also come with great risks, especially if we want to get rich quickly (Gunduz, 2021).

In this research, I will use standard API data of Yahoo stock exchange data and analyze the risk factors and other parameters. Next, and then I will develop a model based on GRU-RNN, and LSTM to compare the performances.

In the next process, I will use the best algorithm which gives good accuracy to predict stock prices for the growing stable sector of the stock market which is either the banking or power sector.

# Plan of Research

Gantt chart:

|  |  |  |
| --- | --- | --- |
| **Tasks:** | **Start date** | **End date** |
| Research Introduction | Jun-9 | Jun 18 |
| Literature Review | Jun 19 | 30 June |
| Define Methodology | Jul 1 | Jul 10 |
| Collect Data Set | Jul 11 | Jul 15 |
| Analyse and Pre-Processing of Dataset | Jul 16 | Jul 27 |
| Visualizing Risk Factors | Jul 28 | Aug 3 |
| Creating Models for GRU-RNN | Aug 4 | Aug 13 |
| Creating Models for LSTM | Aug 14 | Aug 23 |
| Summarize the prediction results and performance of the models | Aug 24 | Aug 30 |
| Proof Reading and Referencing | Aug 31 | Sept 5 |
|  |  |  |
|  |  |  |
| **Tasks:** | **Start on day** | **Duration** |
| Research Introduction | 0 | 10 |
| Literature Review | 11 | 12 |
| Define Methodology | 23 | 10 |
| Collect Data Set | 33 | 4 |
| Analyse and Pre-Processing of Dataset | 37 | 12 |
| Visualizing Risk Factors | 49 | 7 |
| Creating Models for GRU-RNN | 56 | 10 |
| Creating Models for LSTM | 66 | 10 |
| Summarize the prediction results and performance of the models | 76 | 7 |
| Proof Reading and Referencing | 83 | 6 |

# References

Ferreira, F.G., Gandomi, A.H. and Cardoso, R.T., 2021. Artificial intelligence applied to stock market trading: a review. *IEEE Access*, *9*, pp.30898-30917.

Gunduz, H., 2021. An efficient stock market prediction model using a hybrid feature reduction method based on variational autoencoders and recursive feature elimination. *Financial Innovation*, *7*(1), pp.1-24.

Mokhtari, S., Yen, K.K. and Liu, J., 2021. Effectiveness of artificial intelligence in stock market prediction based on machine learning. *arXiv preprint arXiv:2107.01031*.

Nabipour, M., Nayyeri, P., Jabani, H., Mosavi, A. and Salwana, E., 2020. Deep learning for stock market prediction. *Entropy*, *22*(8), p.840.